SEPARATION OF FISCHER-TROPSCH CATALYST/WAX MIXTURES USING DENSE GAS EXTRACTION. Marc W. Eyring, Paul C. Rohar, Richard F. Hickey, and Curt M. White, U.S. Dept. of Energy, PETC, P.O. Box 10940, Pittsburgh, PA 15236-0940 and Michael S. Quiring, Kerr-McGee Corp., Kerr-McGee Technical Center, P.O. Box 25861, Oklahoma City, OK, 73125

The separation of a Fischer-Tropsch catalyst from wax products is an important issue when the synthesis is conducted in a slurry bubble column reactor. This paper describes a new technique based on dense gas extraction of the soluble hydrocarbon components from the insoluble catalyst particles using light hydrocarbons as propane, butane, and pentane as the solvent. The extractions were conducted in a continuous unit operated near the critical point of the extraction gas on a catalyst/wax mixture containing about 4.91 wt% catalyst. The catalyst-free wax was collected in the second stage collector while the catalyst and some insoluble wax components were collected in the first stage collector. The yield of catalyst-free wax was about 60 wt% of the feed mixture. The catalyst content of the catalyst/wax mixture in the first stage was about 14.8 wt%. The catalyst content in the second stage collector was less than 1 part in 100,000.